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Mineral Industry Surveys

For information, contact:
John F. Papp, Chromium Commodity Specialist
U.S. Geological Survey
989 National Center
Reston, VA 20192
Telephone: (703) 648-4963, Fax: (703) 648-7757
E-mail: jpapp@usgs.gov

Joseph M. Krisanda (Data)
Telephone: (703) 648-7987
Fax: (703) 648-7975
E-mail: jkrisand@usgs.gov

Internet: http://minerals.usgs.gov/minerals

CHROMIUM IN JANUARY 2006

On the basis of gross weight, consumption of chromium ferroalloys and metal in January 2006 decreased slightly compared with consumption in December 2005, according to the U.S. Geological Survey.

Included in this Mineral Industry Surveys are U.S. salient chromium statistics, U.S. Government stockpile inventory of chromium materials in January 2006, consumption by end use and consumer stocks of chromium ferroalloys and metal at the end of January 2006, and U.S. foreign trade data for selected chromium-containing materials in December 2005.

Update

The Defense National Stockpile Center (DNSC) announced that 6,250 metric tons (t) of ferrochromium comprising 3,946 t of high-carbon ferrochromium and 2,303 t of low-carbon ferrochromium was sold in February at a value of $5.9 million or $0.43 per pound gross weight (Defense National Stockpile Center, 2006b).

DNSC announced that 598 metric tons (t) of chromium metal was sold in February at a value of $3.16 million or $2.40 per pound gross weight (Defense National Stockpile Center, 2006a).

The International Chromium Development Association prepared a brief report entitled Human Carcinogenicity Risk Assessment of Metallic Chromium and Trivalent Chromium that is oriented to the general public. The article reviews occupational carcinogenicity of metallic chromium and trivalent chromium compounds in humans. The report found that the evidence for such carcinogenicity is inadequate for a variety of reasons. The article concluded that it is generally agreed that occupational exposure to hexavalent chromium species increase the risk for some lung cancer and nose and sinonasal cancer, and that occupational exposure to the trivalent and metallic chromium species are not (Nurminen, 2006§[1]).

References Cited

Defense National Stockpile Center, 2006a, Stockpile accepts chromium metal bids: Defense National Stockpile Center, News Release DNSC-06-2732, February 28, 2 p.

Defense National Stockpile Center, 2006b, Stockpile announces ferrochromium sales for February 2006: Defense National Stockpile Center, News Release DNSC-06-2737a, March 6, 1 p.

Internet Reference Cited

Nurminen, Markku, 2006, Human carcinogenicity risk assessment of metallic chromium and trivalent chromium, accessed March 17, 2006, at URL http://www.worldstainless.org/articles/8909_chromium_icda_n14.pdf.

[1]A reference that includes a section mark (§) is found in the Internet Reference Cited section.

TABLE 1
U.S. SALIENT CHROMIUM STATISTICS[1]

(Metric tons, gross weight)

	2004	2005					2006
	January-December	October	November	December	Fourth quarter	January-December[2]	January
Production:							
Stainless steel production[3]	2,400,000	174,000	178,000	185,000	537,000	2,240,000 [4]	213,000
Components of U.S. supply:							
Stainless steel scrap receipts	987,000	68,900	68,100	57,700	195,000	731,000	NA
Stainless steel scrap consumption	1,410,000	94,000	99,900	87,000	281,000	1,060,000	NA
Imports for consumption:							
Chromite ore	153,000	17,900	3,400	19,100	40,400	165,000	NA
Ferrochromium:							
More than 4% carbon	398,000	53,700	9,370	35,700	98,800	398,000	NA
More than 3% carbon but not more than 4% carbon	30	--	--	--	--	--	NA
More than 0.5%, but not more than 3% carbon	5,720	--	--	--	--	3,530	NA
Not more than 0.5% carbon	31,400	3,610	3,630	3,740	11,000	43,000	NA
Ferrochromium silicon	30,600	3,980	--	2,970	6,950	33,700	NA
Total ferroalloy imports	466,000	61,300	13,000	42,400	117,000	478,000	NA
Chromium metal[5]	9,630	642	711	968	2,320	11,000	NA
Stainless steel	811,000	57,500	57,400	59,900	175,000	770,000	NA
Stainless steel scrap	146,000	6,740	7,750	9,740	24,200	111,000	NA
Distribution of U.S. supply:							
Consumption, industry, chromium ferroalloys and metal	454,000	34,900	33,400	35,600 [r]	105,000	417,000	35,300
Exports:							
Chromite ore	43,100	1,320	835	515	2,670	42,600	NA
Chromium ferroalloys:							
High-carbon ferrochromium	6,580	265	175	504	944	30,700	NA
Low-carbon ferrochromium	1,410	306	1,120	160	1,580	5,460	NA
Ferrochromium silicon	1,150	5	20	7	32	147	NA
Total ferroalloy exports	9,140	577	1,310	671	2,560	36,300	NA
Chromium metal	931	39	120	125	284	1,020	NA
Stainless steel	323,000	24,200	27,200	33,100	84,600	371,000	NA
Stainless steel scrap	478,000	46,000	48,500	56,000	151,000	585,000	NA
Stocks at end of period:							
Consumer, industry, chromium ferroalloys and metal	XX	12,900	12,200 [r]	13,000	XX	XX	13,300
Government stockpile:							
Chromium ferroalloys	XX	498,000	494,000	489,000	XX	XX	480,000
Chromium metal	XX	6,190	6,190	6,190	XX	XX	6,190

[r]Revised. NA Not available. XX Not applicable. -- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]May include revised data.

[3]Data on stainless steel production reported by American Iron and Steel Institute; monthly, quarterly, and year-to-date production of stainless and heat-resisting raw steel.

[4]Includes revised data that is not broken out by specific month.

[5]Includes waste and scrap and other.

TABLE 2
U.S. REPORTED CONSUMPTION AND STOCKS OF CHROMIUM PRODUCTS[1, 2]

(Metric tons, gross weight unless otherwise noted)

	2005		2006
	December	January-December[3]	January
Consumption by end use:			
Alloy uses:			
Iron alloys:			
Steel:			
Carbon steel	338 r	4,350 r	344
High-strength low-alloy steel	524 r	6,160 r	576
Stainless and heat-resisting steel	31,000	361,000 r	30,500
Full alloy steel	1,520 r	18,800 r	1,680
Electrical steel	W	W	W
Tool steel	396	5,220	405
Unspecified steel	W	W	W
Cast irons	W	W	W
Superalloys	870	9,990	829
Other alloys[4]	45	668	42
Total	35,600 r	417,000	35,300
Total, chromium content	20,800 r	243,000	20,700
Consumption by material:			
Low-carbon ferrochromium	1,720	22,400	1,750
High-carbon ferrochromium	30,500	353,000 r	30,200
Ferrochromium silicon	2,900	36,000 r	2,850
Chromium metal	467	5,440	454
Chromite ore	W	W	W
Chromium-aluminum alloy	29	349	31
Other chromium materials	W	W	W
Total	35,600 r	417,000	35,300
Total, chromium content	20,800 r	243,000	20,700
Consumer stocks:			
Low-carbon ferrochromium	1,970 r	XX	1,980
High-carbon ferrochromium	9,570	XX	9,780
Ferrochromium silicon	1,230	XX	1,290
Chromium metal	119	XX	159
Chromite ore	W	XX	W
Chromium-aluminum alloy	33	XX	34
Other chromium materials	W	XX	W
Total	13,000	XX	13,300
Total, chromium content	7,640 r	XX	7,830

[r]Revised. W Withheld to avoid disclosing company proprietary data; included in "Total." XX Not applicable.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Includes estimates.

[3]May include revised data.

[4]Includes welding and alloy hard-facing rods and materials; wear- and corrosion-resistant alloys; and aluminum, copper, magnetic, nickel, and other alloys.

TABLE 3
U.S. GOVERNMENT STOCKPILE INVENTORY
OF CHROMIUM MATERIALS[1, 2]

(Metric tons)

Period	Chromium ferroalloys		Chromium metal
	High-carbon ferro-chromium	Low-carbon ferro-chromium	
2005:			
January	386,000	190,000	6,190
February	378,000	188,000	6,190
March	368,000	187,000	6,190
April	359,000	187,000	6,190
May	359,000	187,000	6,190
June	331,000	182,000	6,190
July	328,000	180,000	6,190
August	324,000	187,000 [3]	6,190
September	327,000 [3]	176,000	6,210 [3]
October	323,000	175,000	6,190
November	320,000	174,000	6,190
December	318,000	171,000	6,190
2006:			
January	312,000	169,000	6,190

[1]Data are rounded to no more than three significant digits.

[2]These Government stocks are reported by the Defense National Stockpile Center in Inventory of Stockpile Materials R-1, which reports uncommitted inventory. Uncommitted inventory is that inventory for which there is no sales contract. Committed inventory is that inventory for which there is a sales contract, however, the material has not yet been shipped. For chromium materials, the R-1 report includes chromium materials that (1) meet specifications and are held in excess of goal and (2) do not meet specifications and are held in excess of goal. The R-1 report excludes chromium materials that are committed and awaiting shipment.

[3]The increase resulted from the reclassification of physical inventory from committed to uncommitted. It did not result from the addition of chromium materials to the stockpile.

Source: Defense National Stockpile Center.

TABLE 4

U.S. EXPORTS OF CHROMITE ORE, CHROMIUM FERROALLOYS, AND METAL[1]

Period	Chromite ore		Chromium ferroalloys[2]			Chromium metal[3]	
	Gross weight (metric tons)	Value (thousands)	Gross weight (metric tons)	Chromium content (metric tons)	Value (thousands)	Gross weight (metric tons)	Value (thousands)
2004:							
December	771	$231	639	388	$897	51	$657
January-December	43,100	10,400	9,140	5,320	12,000	931	17,600
2005:							
January	2,550	618	427	257	610	103	1,070
February	1,540	404	2,150	1,330	2,910	35	796
March	7,910	1,310	3,050	1,850	4,070	66	983
April	6,930	1,820	686	419	913	85	1,580
May	5,040	923	653	402	804	64	1,190
June	516	190	776	486	1,010	91	1,520
July	1,670	697	24,800	16,600	23,800	51	781
August	6,060	1,420	584	356	789	130	1,560
September	7,760	1,320	577	356	680	115	1,940
October	1,320	600	577	355	828	39	1,410
November	835	435	1,310	877	1,490	120	2,120
December	515	203	671	408	923	125	1,930
January-December	42,600	9,940	36,300	23,700	38,900	1,020	16,900

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Includes low-, medium-, and high-carbon ferrochromium and ferrochromium silicon.

[3]Includes chromium metal waste and scrap and unwrought powders.

Source: U.S. Census Bureau.

TABLE 5

U.S. IMPORTS FOR CONSUMPTION OF CHROMITE ORE, FERROCHROMIUM, AND CHROMIUM METAL[1]

(Metric tons)

	2004	2005			
	January-December	October	November	December	January-December[2]
Chromite ore:					
Not more than 40%:					
Gross weight	--	36	--	--	36
Chromic oxide content	--	11	--	--	11
More than 40% but less than 46% chromic oxide:					
Gross weight	1,690	24	24	70	29,700
Chromic oxide content	761	11	11	31	13,700
46% or more chromic oxide:					
Gross weight	151,000	17,800	3,370	19,100	135,000
Chromic oxide content	71,600	8,570	1,580	9,080	63,600
Total, all grades:					
Gross weight	153,000	17,900	3,400	19,100	165,000
Chromic oxide content	72,400	8,590	1,600	9,110	77,300
Ferrochromium:					
Low-carbon:[3]					
Not more than 0.5%:					
Gross weight	31,400	3,610	3,630	3,740	43,000
Chromium content	21,100	2,290	2,520	2,460	29,300
More than 0.5% but not more than 3%:					
Gross weight	5,720	--	--	--	3,530
Chromium content	3,830	--	--	--	2,300
Total, low-carbon:					
Gross weight	37,100	3,610	3,630	3,740	46,600
Chromium content	24,900	2,290	2,520	2,460	31,600
Medium-carbon:[4]					
Gross weight	30	--	--	--	--
Chromium content	16	--	--	--	--
High-carbon:[5]					
Gross weight	398,000	53,700	9,370	35,700	398,000
Chromium content	223,000	30,400	5,730	21,800	232,000
Total, all grades:					
Gross weight	435,000	57,300	13,000	39,400	444,000
Chromium content	248,000	32,700	8,250	24,200	264,000
Chromium metal:					
Unwrought powders	1,350	69	95	148	1,060
Waste and scrap	74	35	1	11	63
Other than waste and scrap and unwrought powders	8,200	538	615	809	9,830
Total, all grades	9,630	642	711	968	11,000

-- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]May include revised data.

[3]Ferrochromium containing not more than 3% carbon.

[4]Ferrochromium containing more than 3% carbon but not more than 4% carbon.

[5]Ferrrochromium containing more than 4% carbon.

Source: U.S. Census Bureau.

TABLE 6
U.S. IMPORTS FOR CONSUMPTION OF CHROMITE ORE AND FERROCHROMIUM SILICON IN 2005,
BY GRADE AND BY COUNTRY[1]

Grade and country	January-December[2] Gross weight (metric tons)	Cr_2O_3 (metric tons)	Chromium content (metric tons)	Value[3] (thousands)
Chromite ore:				
Not more than 40% chromic oxide, Canada	36	11	XX	$17
More than 40% but less than 46% chromic oxide,				
South Africa	29,700	13,700	XX	2,400
46% or more chromic oxide:				
Canada	18	10	XX	9
South Africa	135,000	63,600	XX	20,700
Total	135,000	63,600	XX	20,700
All grades:				
Canada	54	21	XX	26
South Africa	165,000	77,300	XX	23,100
Total	165,000	77,300	XX	23,100
Ferrochromium silicon:				
Kazakhstan	26,000	XX	10,400	24,400
Russia	7,750	XX	3,690	7,230
Total	33,700	XX	14,100	31,600

XX Not applicable.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]May include revised data.

[3]Customs import value generally represents a value in the foreign country and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the merchandise into the United States.

Source: U.S. Census Bureau.

TABLE 7

U.S. IMPORTS FOR CONSUMPTION OF FERROCHROMIUM IN 2005, BY GRADE AND BY COUNTRY[1]

Grade and country	December			January-December[2]		
	Gross weight (metric tons)	Chromium content (metric tons)	Value[3] (thousands)	Gross weight (metric tons)	Chromium content (metric tons)	Value[3] (thousands)
High-carbon ferrochromium:[4]						
Australia	--	--	--	13	9	$11
China	--	--	--	13	8	11
India	20	12	$16	20	12	16
Kazakhstan	17,500	12,100	14,000	115,000	79,400	112,000
Russia	215	135	143	35,100	23,000	28,900
South Africa	10,400	5,130	5,460	187,000	93,600	115,000
Sweden	100	67	108	260	173	293
Zimbabwe	7,430	4,300	4,860	61,200	36,200	47,500
Total	35,700	21,800	24,600	398,000	232,000	303,000
Low-carbon ferrochromium:[5]						
More than 0.5% but not more than 3% carbon:						
India	--	--	--	20	13	17
Kazakhstan	--	--	--	870	601	1,370
Russia	--	--	--	1,830	1,240	2,030
South Africa	--	--	--	810	446	905
Total	--	--	--	3,530	2,300	4,330
Not more than 0.5% carbon:						
China	--	--	--	94	66	212
France	--	--	--	4	3	8
Germany	480	333	1,010	5,770	4,040	11,600
Japan	140	98	382	2,870	2,010	8,130
Kazakhstan	552	381	769	3,910	2,680	5,880
Mexico	--	--	--	41	34	72
Netherlands	--	--	--	40	28	50
Russia	1,690	1,170	2,470	27,300	18,800	39,600
South Africa	850	462	681	2,950	1,630	2,760
Sweden	19	14	68	38	27	136
Turkey	2	1	4	5	3	12
Total	3,740	2,460	5,380	43,000	29,300	68,500
All grades:						
Australia	--	--	--	13	9	11
China	--	--	--	107	74	223
France	--	--	--	4	3	8
Germany	480	333	1,010	5,770	4,040	11,600
India	20	12	16	40	24	33
Japan	140	98	382	2,870	2,010	8,130
Kazakhstan	18,100	12,500	14,700	119,000	82,700	119,000
Mexico	--	--	--	41	34	72
Netherlands	--	--	--	40	28	50
Russia	1,910	1,300	2,610	64,300	43,000	70,500
South Africa	11,300	5,590	6,140	190,000	95,600	119,000
Sweden	119	80	176	298	201	428
Turkey	2	1	4	5	3	12
Zimbabwe	7,430	4,300	4,860	61,200	36,200	47,500
Total	39,400	24,200	29,900	444,000	264,000	376,000

-- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]May include revised data.

[3]Customs import value generally represents a value in the foreign country and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the merchandise into the United States.

[4]Ferrochromium containing more than 4% carbon.

[5]Ferrochromium containing not more than 3% carbon.

Source: U.S. Census Bureau.

TABLE 8

U.S. IMPORTS FOR CONSUMPTION OF CHROMIUM METAL IN 2005, BY GRADE AND BY COUNTRY[1]

Grade and country	December		January-December[2]	
	Gross weight (metric tons)	Value[3] (thousands)	Gross weight (metric tons)	Value[3] (thousands)
Unwrought powders:				
Brazil	--	--	(4)	$2
China	49	$470	330	3,050
France	3	19	13	123
Germany	--	--	19	197
Japan	16	782	298	8,870
Korea, Republic of	--	--	1	22
Malaysia	--	--	1	6
Russia	80	511	344	2,050
Spain	--	--	57	248
Sweden	--	--	(4)	3
United Kingdom	(4)	65	2	516
Total	148	1,850	1,060	15,100
Waste and scrap:				
Germany	--	--	6	94
Japan	2	54	15	230
Singapore	8	45	43	235
United Kingdom	1	4	1	4
Total	11	103	63	564
Other than waste and scrap and unwrought powders:				
Austria	--	--	(4)	4
China	310	1,610	2,650	13,800
France	275	2,250	2,580	20,600
Germany	--	--	38	324
India	--	--	1	5
Italy	(4)	3	(4)	3
Japan	--	--	32	1,080
Russia	60	400	2,850	25,200
United Kingdom	164	1,180	1,670	11,000
Total	809	5,440	9,830	72,000
All grades:				
Austria	--	--	(4)	4
Brazil	--	--	(4)	2
China	359	2,080	2,980	16,800
France	278	2,270	2,590	20,800
Germany	--	--	62	616
India	--	--	1	5
Italy	(4)	3	(4)	3
Japan	18	835	345	10,200
Korea, Republic of	--	--	1	22
Malaysia	--	--	1	6
Russia	140	910	3,200	27,300
Singapore	8	45	43	235
Spain	--	--	57	248
Sweden	--	--	(4)	3
United Kingdom	164	1,250	1,670	11,500
Total	968	7,390	11,000	87,700

-- Zero.

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]May include revised data.

[3]Customs import value generally represents a value in the foreign country and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the merchandise into the United States.

[4]Less than ½ unit.

Source: U.S. Census Bureau.

TABLE 9

U.S. TRADE OF STAINLESS STEEL, BY PRODUCT, IN 2005[1]

Stainless steel product	December		January-December	
	Gross weight (metric tons)	Value[2] (thousands)	Gross weight (metric tons)	Value[2] (thousands)
Exports:				
Ingot	507	$2,570	8,090	$41,000
Flat-rolled (width > 600 mm)	7,870	25,800	158,000	441,000
Flat-rolled (width < 600 mm)	8,390	31,600	115,000	411,000
Bars and rods in irregular coils	282	1,220	6,030	19,100
Other bars and rods	1,990	11,900	27,500	158,000
Wire	453	2,950	5,780	44,000
Tubes, pipes, hollow profiles	13,600	27,700	50,100	229,000
Total	33,100	104,000	371,000	1,340,000
Stainless steel scrap	56,000	60,900	585,000	670,000
Grand total	89,200	165,000	956,000	2,010,000
Imports:				
Ingot	11,600	31,600	145,000	407,000
Flat-rolled (width > 600 mm)	24,700	58,700	299,000	785,000
Flat-rolled (width < 600 mm)	3,400	12,800	44,200	173,000
Bars and rods in irregular coils	2,360	7,290	37,700	110,000
Other bars and rods	7,280	29,700	103,000	404,000
Wire	2,970	13,100	39,800	174,000
Tubes, pipes, hollow profiles	7,580	46,600	102,000	581,000
Total	59,900	200,000	770,000	2,630,000
Stainless steel scrap	9,740	9,640	111,000	124,000
Grand total	69,600	209,000	881,000	2,760,000

[1]Data are rounded to no more than three significant digits; may not add to totals shown.

[2]Export value is free alongside ship (f.a.s.). Import value is Customs import value, which generally represents a value in the foreign country and therefore excludes U.S. import duties, freight, insurance, and other charges incurred in bringing the merchandise into the United States.

Source: U.S. Census Bureau.